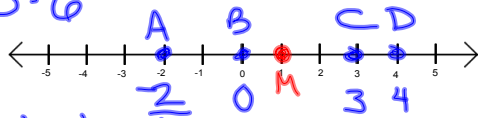


## 1.3 Use Midpoint and Distance Formulas

$$AB = |0 - 2| = 2$$

$$AD = 6$$

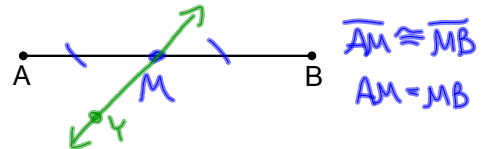


midpoint of  $\overline{AD}$

Find midpoint-average coordinates  
Find distance-subtract coordinates

## Midpoint of a Segment

Midpoint—point that divides a segment into two congruent segments



Segment Bisector—a point, ray, segment, line, or plane that intersects a segment at its midpoint

$\overleftrightarrow{MP}$  is a segment bisector

Sep 17-11:19 AM

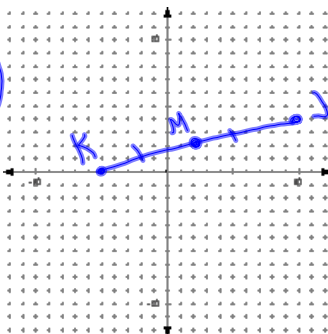
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Find the midpoint.  
J(10,4) K(-5, 0)

$$M\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$$

$$\left(\frac{10+(-5)}{2}, \frac{4+0}{2}\right)$$

$$M\left(\frac{5}{2}, 2\right)$$



Do Find the midpoint

1. (4, -6) (-3, 2)

2. (-4, -3) (8, 5)

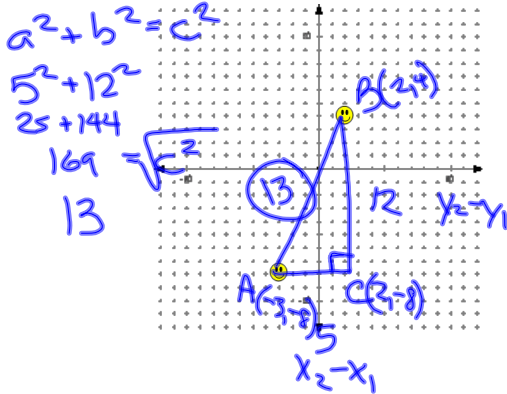
$$\left(\frac{1}{2}, -2\right)$$

$$(2, 1)$$

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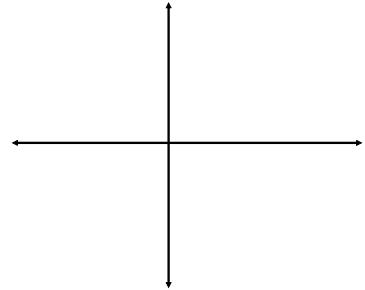
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Find the distance between A(-3,-8) and B(2,4).



Jun 20-7:59 AM

In General:



Jun 20-8:02 AM

The distance formula

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Find MN and OP

Do

1. M(-5, -2) N(1, 4) =  $6\sqrt{2}$
2. O(-1, -1) P(20, 6) =  $7\sqrt{10}$

$$21^2 = 441$$

Sep 17-11:22 AM

Sep 17-11:22 AM

M is the midpoint of  $\overline{UD}$

U(5,2) M(3, -1) D(x,y)

$$\begin{aligned} \frac{5+x}{2} &= 3 \\ 5+x &= 6 \\ x &= 1 \end{aligned} \quad \left\{ \quad \begin{aligned} \frac{2+y}{2} &= -1 \\ 2+y &= -2 \\ y &= -4 \end{aligned} \right.$$

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M is the midpoint of  $\overline{UD}$

U(-1,2) M(-6, 8) D( ? )

(-11, 14)

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Do

1. U(-5, -3) M(-6, 4) Find D (-7, 11)

2. M(-3, 3) D(-14, 12) Find U (8, -6)

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HW

p19-20

#s 3-5, 11-15, 17, 18, 25-27, 31-33, 43

Sep 17-11:23 AM